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60/113,526 22 December 1998 (22.12.1998) **US**
- (71) Applicant (for all designated States except US): **DAL-
HOUSIE UNIVERSITY** [CA/CA]; Office of the Presi-
dent, Arts and Administration Building, 6299 South Street,
Halifax, Nova Scotia B3H 4H6 (CA).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **BROWN, Robert**
[CA/CA]; 18 Swanton Drive, Dartmouth, Nova Scotia
B2W 2C4 (CA). **POHAJDAK, Bill** [CA/CA]; 83 Shrews-
bury Road, Dartmouth, Nova Scotia B2V 2C4 (CA).
KIMMINS, Warwick, Charles [CA/CA]; 5865 Balmoral
Road, Halifax, Nova Scotia B3h 1A5 (CA). **HORROCKS,
Janet** [GB/GB]; 5 Paradise Road, Dundee DD1 1JB (GB).
MACLAREN, Leslie [CA/CA]; 9 Mosswood Lane, Truro,
Nova Scotia B2N 5B1 (CA).
- (74) Agents: **MORROW, Joy, D. et al.**; Smart & Biggar, 900
- 55 Metcalfe Street, Station D, P.O. Box 2999, Ottawa,
Ontario K1P 5Y6 (CA).
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ning of each regular issue of the PCT Gazette.

(54) Title: **COMPOSITIONS AND METHODS FOR REDUCING OR PREVENTING FERTILIZATION IN FISH AND BIRDS**

(57) Abstract: Disclosed is an immunocontraceptive vaccine composition comprising a teleost homolog of zona pellucida (TH-ZP), together with a pharmaceutically acceptable diluent or carrier, for reducing or preventing fertilization in a fish, and a method for its use. Also disclosed is an immunocontraceptive vaccine composition comprising an antigen from an inner perivitelline layer (IPVL), together with a pharmaceutically acceptable diluent or carrier, for reducing or preventing fertilization in a bird, and a method for its use.

WO 00/37100 A3

INTERNATIONAL SEARCH REPORT

Intr 'ional Application No

PCT/CA 99/01225

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K39/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

BIOSIS, EPO-Internal, CHEM ABS Data, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	HINDS LYN A ET AL: "Immuno-contraceptive control for carp." 1997, WORKSHOP;ALBURY, NEW SOUTH WALES, AUSTRALIA; OCTOBER 22-24, 1996, CONTROLLING CARP: EXPLORING THE OPTIONS FOR AUSTRALIA. 1997 CSIRO PUBLICATIONS 314 ALBERT STREET, EAST MELBOURNE, VICTORIA, AUSTRALIA, PAGE(S) 108-118 XP000879881 ISBN: 0-643-05883-4 page 109 -page 112 ---	1-9
Y	CHANG Y.S. ET AL: "Molecular cloning, structural analysis and expression of carp zp3 gene" MOLECULAR REPRODUCTION AND DEVELOPMENT, vol. 44, 1996, pages 295-304, XP000891769 cited in the application the whole document ---	1-9
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

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- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

11 September 2000

Date of mailing of the international search report

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Fernandez y Branas, F

INTERNATIONAL SEARCH REPORT

Intr ional Application No
PCT/CA 99/01225

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 92 12247 A (PROTEUS MOLECULAR DESIGN) 23 July 1992 (1992-07-23) the whole document ---	1-9
A	WO 93 25231 A (KIMMINS WARWICK CHARLES ;MEZEI MICHAEL (CA); POHAJDAK BILL (CA); B) 23 December 1993 (1993-12-23) the whole document ---	1-9
A	HJERTEN S ET AL: "Studies of fish zona pellucida by high-performance ion-exchange chromatography on agarose columns and free zone electrophoresis" JOURNAL OF CHROMATOGRAPHY BIOMEDICAL APPLICATIONS, vol. 341, 1985, pages 295-304, XP000891408 the whole document ---	1-9
A	CHANG Y.S. ET AL: "Molecular cloning, structural analysis and expression of carp ZP2 gene" MOLECULAR REPRODUCTION AND DEVELOPMENT, vol. 46, 1997, pages 258-267, XP000891751 cited in the application the whole document ---	1-9
A	DATABASE SCISEARCH 'Online! MOCHIDA K ET AL: "SPERM INFERTILITY CAUSED BY EXPERIMENTAL TESTICULAR AUTOIMMUNITY IN THE NILE TILAPIA" retrieved from STN Database accession no. 159365 XP002134944 abstract & NIPPON SUISAN GAKKAISHI-BULLETIN OF THE JAPANESE SOCIETY OF SCIENTIFIC FISHERIES, (FEB 1993) VOL. 59, NO. 2, PP. 253-261., the whole document ---	1-9
A	US 5 656 488 A (CURTISS III ROY ET AL) 12 August 1997 (1997-08-12) column 3, line 58 - line 65 column 4, line 4 - line 6 column 7, line 11 - line 22 column 9, line 21 - line 24 -----	10-22

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 99/01225

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/CA 99/01225

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-9

Immunocontraceptive vaccine compositions comprising a teleost homolog of zona pellucida (TH-ZP) as defined in claims 1-7 for reducing or preventing fertilization in a fish; Methods for reducing or preventing fertilization in fish by administering the above compositions.

2. Claims: 10-22

Immunocontraceptive vaccine compositions comprising an antigen from an inner perivitelline layer (IPVL) of a bird egg as defined in claims 10-20 for reducing or preventing fertilization in a bird; Methods for reducing or preventing fertilization in a bird.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 99/01225

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9212247 A	23-07-1992	AU 652611 B AU 1161792 A CA 2100057 A CN 1063109 A DK 80993 A EP 0566611 A FI 933138 A GB 2267496 A,B HU 66829 A JP 6504537 T NO 932491 A NZ 241240 A PT 99991 A ZW 392 A	01-09-1994 17-08-1992 10-07-1992 29-07-1992 06-07-1993 27-10-1993 08-07-1993 08-12-1993 30-01-1995 26-05-1994 08-07-1993 25-11-1992 29-01-1993 22-07-1992
WO 9325231 A	23-12-1993	AU 4303493 A CA 2137363 A US 5736141 A	04-01-1994 23-12-1993 07-04-1998
US 5656488 A	12-08-1997	AT 177787 T AU 9094191 A CA 2096529 A CN 1072454 A DE 69131014 D DE 69131014 T EP 0558631 A ES 2133311 T IL 100121 A WO 9209684 A ZA 9109213 A	15-04-1999 25-06-1992 22-05-1992 26-05-1993 22-04-1999 07-10-1999 08-09-1993 16-09-1999 15-06-1998 11-06-1992 26-08-1992